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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/877,923 | 06/08/2001 | Eckard Deichsel | 21137.PUS | 2515 |

7590 05/22/2003
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EXAMINER

MENEFEE, JAMES A

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2828

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

P.S.

Office Action Summary

Application No.

09/877,923

Applicant(s)

DEICHSEL ET AL.

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

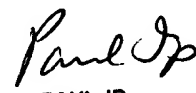
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-26 is/are rejected.
- 7) ☒ Claim(s) 11 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


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TECHNOLOGY CENTER 2800

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 18 April 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6. 6) ☐ Other: _____

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DETAILED ACTION

Response to Amendment

In response to the amendment filed 18 April 2003, claim 6 is cancelled and claims 1, 13, and 14 amended, and claims 24-26 added. Claims 1-5 and 7-26 are pending.

Drawings

The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 18 April 2003 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

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Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.185(a). Failure to take corrective action within the set (or extended) period will result in **ABANDONMENT** of the application.

Claim Objections

Claims 11 and 19 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claims 11 and 19 merely recite a limitation regarding the method of forming the device. The method of forming a device is not germane to the patentability of the device itself, and thus this method is not given patentable weight. Since the claim is not given any patentable weight, then the claim contains no limitations, and thus does not further limit the parent claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-13, 22, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The intermediate layer and antireflective layer of claim 1 are claimed as "optional". It is indefinite whether the invention requires these layers to be included in the device. Since the dependent claims further limit these layers, they are deemed to be

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required by the invention, and thus the term "optional" should be removed from claim 1 before each of these elements.

Claim 15 recites the limitation "the reflector". The claim is rejected under 35 U.S.C. 112, second paragraph, as there is insufficient antecedent basis for this limitation in the claim. This term should be changed to -the substrate-.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 7, and 9-26, are rejected under 35 U.S.C. 102(e) as being anticipated by Weingarten et al. (US 6,393,035). Weingarten discloses the claimed invention as follows (see esp. Figs. 9-11 and discussion thereof):

Regarding claim 1, Weingarten discloses a saturable reflector for a laser wavelength λ wherein a reflector 41 comprising a first reflector material 42.1-p and a second reflector material 43.1-p is applied to a surface of a substrate 40, and a layer sequence 44-46 with a saturable absorbing effect is applied onto the reflector, characterized in that the laser sequence 44-46 contains a strained quantum well 44, a cap 45 (to the right of 44), and intermediate layer 45 (left of 44). The layer 45 is disclosed as transparent, and thus is an antireflective layer. The layer sequence is disclosed as a half wavelength layer, thus is a whole number multiple of

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$\lambda/2$. The material composition of the cap layer (45 right) and the intermediate layer (45 left) independently comprise GaAs, which is the same as one of the reflector materials. It is inherent that the material composition of the quantum well 6, its layer thickness, and its strain in the layer structure will serve to define the absorbing effect within a wavelength range including λ . It is inherent that the degree of saturable effect is defined by the distance between the strained quantum well and the boundary of the cap layer. The reflector will not be disposed in a vacuum, and thus is adjacent to a surrounding gaseous medium.

Regarding claim 2, the quantum well 6 is adjacent to the cap layer (45 right).

Regarding claim 3, the quantum well 6 is surrounded by the intermediate layer and the cap layer 45.

Regarding claim 4, the material of the intermediate layer is identical to that of the cap layer.

Regarding claims 5 and 22, the intermediate layer is made of the same material as one of the reflector materials, and thus the lattice mismatch between such materials will be less than that claimed.

Regarding claim 7, Weingarten discloses that the layers of the reflector may be GaAs and AlAs, and it is disclosed that the optical thickness of these layers is $\lambda/4$. This leads to the physical thicknesses as claimed (optical thickness = (physical thickness) x (refractive index)). The quantum well is made of $\text{In}_x\text{Ga}_{1-x}\text{As}$. It is inherent that these materials will have the effect as claimed.

Regarding claim 9, the reflector is a highly reflective metal mirror.

Regarding claim 10, the cap layer is coated with an antireflective passivation layer 46.

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Regarding claim 11, the claim is not given patentable weight as shown in the objections above.

Regarding claim 12, the layer sequence is shown to be a multiple of $\lambda/2$ as in the rejection of claim 1 above. The layer sequence only includes the layers shown in claim 12.

Regarding claim 13, the adjacent layers to the quantum well are thicker than the quantum well. The adjustability of the saturable absorbing effect is inherent.

Regarding claim 14, the limitations are all shown as in the rejection of claim 1. Further, as the GaAs layer 45 is disclosed as transparent, the substrate 40 that is also made of GaAs will also be transparent.

Regarding claim 15, the quantum well 6 is surrounded by the intermediate layer and the cap layer 45.

Regarding claim 16, the material of the intermediate layer is identical to that of the cap layer.

Regarding claims 17 and 23, the intermediate layer is made of the same material as the substrate materials, and thus the lattice mismatch between such materials will be less than that claimed.

Regarding claim 18, the cap layer is coated with an antireflective passivation layer 46.

Regarding claim 19, the claim is not given patentable weight as shown in the objections above.

Regarding claim 20, the layer sequence is shown to be a multiple of $\lambda/2$ as in the rejection of claim 1 above. The layer sequence only includes the layers shown in claim 12.

Regarding claim 21, the adjacent layers to the quantum well are thicker than the quantum well. The adjustability of the saturable absorbing effect is inherent.

Regarding claim 24, the material of the intermediate layer and of the last layer of the reflector 43.p are both GaAs.

Regarding claims 25-26, the limitations are taught as in the rejections of claims 1 and 14. Due to the materials involved, the lattice mismatch will inherently be as claimed. The rest of the limitations are simply claimed properties (i.e. degree of saturable effect), and are also inherent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weingarten in view of Cunningham et al. (previously cited US 5,701,327).

Weingarten discloses that the layers of the reflector may be GaAs and AlAs, and it is disclosed that the optical thickness of these layers is $\lambda/4$. This leads to the physical thicknesses as claimed (optical thickness = (physical thickness) x (refractive index)). It is not disclosed that the quantum well should be made of the materials as claimed. Cunningham shows that these materials for use as a quantum well in a saturable reflector are known in the art (par. bridging col. 5-6). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the quantum wells out of this material, since it has been held to

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be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. It is inherent that these materials will have the effect as claimed.

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
May 13, 2003


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